



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,798	10/13/2005	Tokuo Tsuura	0445-0352PUS1	8677
2292	7590	05/18/2007		
BIRCH STEWART KOLASCH & BIRCH			EXAMINER	
PO BOX 747			CORDRAY, DENNIS R	
FALLS CHURCH, VA 22040-0747				
			ART UNIT	PAPER NUMBER
			1731	
			NOTIFICATION DATE	DELIVERY MODE
			05/18/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/534,798

Applicant(s)

TSUURA ET AL.

Examiner

Dennis Cordray

Art Unit

1731

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 12 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

The substitute specification, filed 2/13/2007, has been entered into the record.

Applicant's amendments and arguments filed 3/13/2007 have failed to overcome the previous rejections.

Amendments to the claims include an addition to the preamble of Claim 1 reciting "into which a molten metal is poured." This is a recitation of intended use, which carries no patentable weight. The intended use does not alter the claimed structure. In addition, the foundry paper riser of Brown et al has the same intended use, the resistance to high heat being augmented by spraying the paper with a fire retardant to protect the paper from ignition up to temperatures of 3500 °F (col 9, lines 3-21). Note that the use of "comprising" in the instant claims does not preclude the use of additional fire retardant compositions.

Applicant has amended Claim 1 to include a carbon fiber "for reducing thermal shrinkage." This is also an intended use for carbon fiber that does not further limit the structure. Since the composition of the references as combined in the rejections comprises carbon fiber content within the claimed range, the paper so made will have the claimed resistance to thermal shrinkage. The data submitted concerning the thermal shrinkage of the inventive paper are acknowledged. However, there has been no comparison made with the papers of Lee, Chaluda or Ling-Chen.

Applicant has amended Claims 1 and 9 to recite that "the base paper is wound with an overlap between adjacent turns or a plurality of base papers are wound on top

Art Unit: 1731

of one another.” The paper tube of Brown et al is made by winding a plurality of base papers over the top of one another (col 7, line 60 to col 8, line 2; Figs 2&3).

Applicant has argued that the references cannot be combined because they are from non-analogous art. The references teach paper products that withstand high heat applications, thus are analogous art and/or solve the same problem of obtaining resistance to high heat. One of ordinary skill in the art would have turned to any prior art for teachings that solve a similar problem, making a paper product resistant to high heat. Applicant has argued that the products of some of the references cannot withstand temperatures of 1400 degrees. As discussed above, the foundry paper riser of Brown et al is treated to have a resistance to temperatures up to 3500 °F. Making the base paper inherently heat resistant by using the compositions of Lee, Chaluda or Ling-Chen would have been obvious to one of ordinary skill in the art to aid in preventing the ignition of the structure, with a reasonable expectation of success. Note also that the species of molten metal to be poured is not recited in the claim. Casting with metals having low melting temperatures, such as lead, tin and zinc is possible without requiring extremely high temperature resistance.

In response to applicant's argument that the paper of Ling-Chen is used at a temperature of 80 °C to 90 °C. Ling-Chen teaches that the paper has a burning point of about 250 °C and an ignition point of about 450 °C (col 4, lines 58-62). The goal of the paper riser of Brown is to resist ignition and to decompose into harmless carbon ash (col 4, lines 44-57). The paper of Ling-Chen will not ignite at the melting temperature of

Art Unit: 1731

the metals listed above and can be further treated by spraying with fire retardant to prevent ignition to much higher temperatures.

Why would it not have been obvious to one of ordinary skill in the art to take advantage of an inherently fire resistant paper, such as that of Lee, Chaluda or Ling-Chen in the paper riser of Brown?

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1 and 3-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brown et al (4981166) in view of Lee (5989390).

Brown et al discloses a spirally wound paper tube used for a feed tube in a sand mold for molten metal in casting (Abs). The paper tube is disposed in a casting sand mold in a sprue or riser cavity (col 5, lines 13-24). Brown et al also teaches that a spirally wound tube is known to provide additional strength (col 8, lines 55-59). The paper tube of Brown et al is made by winding multiple base papers over the top of one another (col 7, line 60 to col 8, line 2; Figs 2&3). The sleeve is treated with a flame retardant so it is resistant to the high temperatures of molten metal.

Brown et al does not disclose that the composition of paper used to make the spirally wound tube comprises carbon fibers, organic fibers and a binder. Brown et al also does not disclose that the paper contains an inorganic binder.

Lee discloses a friction paper comprising, by weight, 10-65% cellulose fibers (organic fibers), 5-50% carbon fibers, 5-50% activated carbon, 1-20% novoloid fibers

Art Unit: 1731

(organic fibers), up to 65% diatomaceous earth, and latex, the paper being impregnated with a thermosetting resin (Abs). Suitable thermosetting resins include phenolic and epoxy resins, which are recited on p 5, lines 20-21 of the instant Disclosure. The resin is present in an amount 5-50% of the paper (col 4, lines 19-26). The composition significantly overlays the claimed composition. Diatomaceous earth comprises mainly amorphous silica and hydrated silica. The paper is made using a drylaid, airlaid or wetlaid process on a standard paper machine (col 2, line 66 to col 3, line 5). The thermosetting resin can be a component of the original composition (slurry) or can be added as a post treatment (col 2, lines 44-46). Due to its use as a friction paper, the paper maintains strength at high temperatures.

The art of Brown et al, Lee and the instant invention is analogous as pertaining to paper and paper products that are resistant to high heat. It would have been obvious to one of ordinary skill in the art to use the paper of Lee to make the feed tube of Brown et al because it is heat resistant and maintains strength at high temperature. The diatomaceous earth and phenolic or epoxy resins have different melting points. The diatomaceous earth will function as an inorganic silica binder in the paper because the composition of Lee and the instant invention are substantially the same. The paper of Brown et al in view of Lee will also have the claimed resistance to thermal shrinkage because, where the claimed and prior art apparatus or product are identical or substantially identical in structure or composition, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). In other words, when the structure recited in the

reference is substantially identical to that of the claims, the claimed properties or functions are presumed to be inherent.

Claims 1 and 3-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brown et al (4981166) in view of Chuluda (4256801).

Brown et al does not disclose that the composition of paper used to make the spirally wound tube comprises carbon fibers, organic fibers and a binder. Brown et al also does not disclose that the paper contains an inorganic binder.

Chuluda discloses a flame resistant flexible organic fiber sheet comprising, by weight, 25-65% cellulose fibers, 5-20% carbon fibers 5-20% flame resistant organic fibers, fillers, a synthetic binder and an oil resistant elastomeric sizing (Abs). The binder can be a phenol-formaldehyde resin (col 4, lines 37-40). The flame resistant fibers are crosslinked phenolic fibers, known as novoloid fibers (col 3, lines 31-34). The resin is added by impregnation or by beater addition into the paper stock (col 4, lines 29-50). The paper can contain up to 30% diatomaceous earth (col 3, lines 65-68). The flexibility of the paper would make it readily usable for spiral winding.

The art of Brown et al, Chuluda and the instant invention is analogous as pertaining to paper and paper products that are resistant to high heat. It would have been obvious to one of ordinary skill in the art to use the paper of Chuluda to make the feed tube of Brown et al because it is heat resistant and maintains strength at high temperature. The diatomaceous earth and phenolic or epoxy resins have different melting points. The diatomaceous earth will function as an inorganic silica binder in the

Art Unit: 1731

paper for the reasons previously recited. The paper of Brown et al in view of Chaluda will also have the claimed resistance to thermal shrinkage for reasons given previously.

Claims 1, 3, 7-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brown et al (4981166) in view of Ling-Chen (6540874).

Brown et al does not disclose that the composition of paper used to make the spirally wound tube comprises carbon fibers, organic fibers and a binder. Brown et al also does not disclose that the paper contains an inorganic binder.

Ling-Chen discloses a carbon fiber paper comprising, by weight, 10-50% carbon fibers and 50-90% cellulose fibers with resin (Abs; col 1, line 64 to col 2, line 7). The cellulose fiber to resin content is 80-85:15-20% by weight. The resin is a phenolic resin added to the slurry (col 2, lines 66-67). The paper can be processed into various products (Abs), thus is flexible.

The art of Brown et al, Ling-Chen and the instant invention is analogous as pertaining to paper and paper products that are resistant to high heat. It would have been obvious to one of ordinary skill in the art to use the paper of Ling-Chen to make the feed tube of Brown et al because it is heat resistant. The flexibility of the paper would make it readily usable for spiral winding. The paper of Brown et al in view of Ling-Chen will also have the claimed resistance to thermal shrinkage for reasons given previously.

Art Unit: 1731

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Cordray whose telephone number is 571-272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ORR
DRC

St. Mi.
STEVEN P. GRIFFIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700